# MET NORFOLK QM WEATHER OBSERVER COURSE REV 3/96

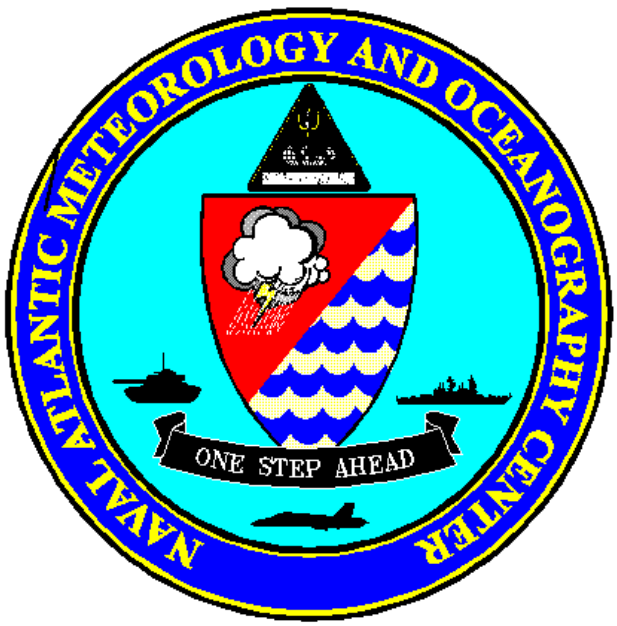
**COURSE LENGTH**: APPROX 6 HOURS

**LUNCH:** 1130-1230 (FLEXIBLE)

**1 TESTS:** (POST TEST)

**REFS:**

1. NAVMETOCCOMINST 3144.1D (JUL 96)
2. NWS OBSERVING HANDBOOK (JAN 96)
3. FEDERAL METEOROLOGICAL HANDBOOK (FMH-1) (DEC 95)
4. VARIOUS MESSAGES



# BASIC INSTRUCTIONS FOR TAKING AND ENCODING WEATHER OBSERVATIONS:

- **PART A:**
  - TOP PORTION OF FORM
  - METAR FORMAT
- **PART B:**
  - BOTTOM PORTION OF FORM
  - SHIP SYNOPTIC CODE
- **PART C:**
  - QM INFO
  - MOVREP WEAX/OTSR GUIDELINES
  - POC'S FOR PUBS

# SHIP INFORMATION TOP COLUMN (HORIZONTAL)

- **DAY (UTC):**
  - ENTER THE DATE IN **UTC**. THE DATE CHANGES AT **0001Z** WITH THE START OF A NEW FORM.

- **MONTH/YEAR :**
  - ENTER THE MONTH AS A 3 LETTER IDENTIFIER (APR, MAY FEB). YEAR 1996, 1997

- **SHIPS CALL SIGN:**
  - ENTER THE SHIPS 4 LETTER IDENTIFIER (NTIC, NYKT, NJFK)

- **SHIP'S TYPE, NAME & HULL NUMBER:**
  - CHECK USS, USNS OR OTHER
  - ENTER SHIP'S FULL NAME & HULL NUMBER

- **RATE OF OBERVER:**
  - CHECK THE QUARTERMASTER BOX

# THE VERTICAL COLUMNS (COLS 1 & 2)

- **TYPE OF REPORT: (COL 1)**

**ME (METAR):** STANDARD HOURLY OBSERVATION

**SP (SPECIAL):** TAKEN WHEN SIGNIFICANT WEATHER EVENTS OCCUR (SEE CRITERIA TABLE).

- **DATE AND TIME COLUM 2:**

1. DO NOT RECORD THE DATE
2. RECORD THE TIME IN UTC ONLY
   - MUST BE WITHIN 5 MINUTES TO THE HOUR (0155, 0357, 0959)

| TYPE METAR | DATE & TIME | WIND | | | | VISIBILITY |
|---|---|---|---|---|---|---|
| | | DIRECTION | SPEED | GUST | VARIABILITY | |
| SPECI | (X) UTC ( ) LST | (true) | (knots) | (knots) | (true) | (Visibility) |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| ME | 1156 | | | | | |
| ME | 1256 | | | | | |
| SP | 1327 | | | | | |

# WIND DIRECTION (COL 3)

- **NOTE:** OBSERVE WIND DIRECTION/SPEED FLUCTUATIONS FOR **2 MINUTES.**
  - OBSERVE VARIATIONS IN DIRECTION AND FLUCTUATIONS IN SPEED DURING THE PERIOD.

- **WIND DIRECTION (COLUMN 3):**
  1. RECORD TRUE WIND DIRECTION IN 3 DIGITS IN TENS OF DEGREES (**FROM** THE DIRECTION THE WIND IS BLOWING).
  2. ENTER **"000"** WHEN THE WINDS ARE CALM.
  3. ENTER **"VRB"** WHEN WIND DIRECTION VARIES BY 60 DEG OR MORE AND WIND SPEEDS ARE GREATER THAN 6 KNOTS.

  EXAMPLE: ( 360, 270, VRB)

| TYPE METAR SPECI | DATE & TIME (X) UTC ( ) LST | WIND | | | | VISIBILITY |
|---|---|---|---|---|---|---|
| | | DIRECTION (true) | SPEED (knots) | GUST (knots) | VARIABILITY (true) | (nm) |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| ME | 1156 | 340 | | | | |
| ME | 1258 | 310 | | | | |
| SP | 1327 | 000 | | | | |

# WIND: SPEED , GUSTS & VARIABILITY (COLS 4, 5, & 6)

- WIND SPEED (COL 4):
  - RECORD WIND SPEED IN WHOLE KNOTS
  - FOR CALM WINDS ENTER **"00"**
  - SPEEDS <10 KNOTS PREFIX WITH A ZERO **"07"**

- WIND GUSTS (COL 5):

  ENTER WIND GUSTS IN **COL 5** WHEN THE WIND SPEED FLUCTUATES 10 KNOTS OR MORE BETWEEN PEAKS & LULLS.

  - PREFIX SPEED OF GUST WITH A **"G".** (AG'S ONLY)

- WIND VARIABILITY (COL 6):

  ENTER WHEN THE WIND DIRECTION VARIES BY **60 DEGREES** OR MORE.

  - ENTER THE EXTREMES OF DIRECTIONAL VARIABILITY.

| TYPE METAR SPECI | DATE & TIME (X) UTC ( ) LST | WIND | | | | VISIBILITY |
|---|---|---|---|---|---|---|
| | | DIRECTION (true) | SPEED (knots) | GUST (knots) | VARIABILITY (true) | (nm) |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| ME | 1156 | 340 | 12 | G20 | 300V030 | |
| ME | 1258 | 310 | 06 | | | |
| SP | 1327 | 000 | 00 | | | |

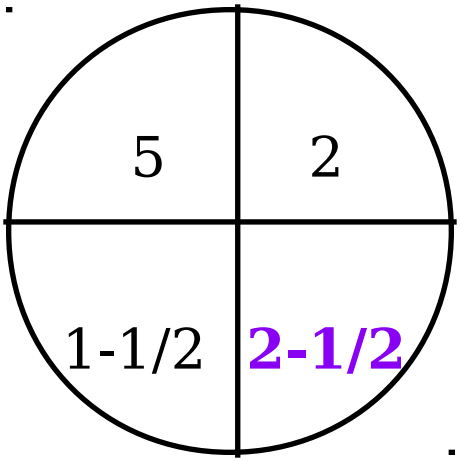
# VISIBILITY (COL 7)

- **PREVAILING VISIBILITY**: THE GREATEST DISTANCE THAT OBJECTS CAN BE SEEN THROUGHOUT AT LEAST 1/2 OF THE HORIZON CIRCLE. ( **USE 4 SECTORS** )
  (NOT NECESSARILY CONTINUOUS)

DETERMINE PREVAILING VISIBILITY:

1. **CHOOSE 3 OF THE FOUR SECTORS THAT HAVE THE GREATEST VISIBILITY (2, 2-1/2, 5).**
2. **CHOOSE THE 2 HIGHEST VALUES (2-1/2, 5).**
3. **THE LOWER OF THE TWO VALUES REPRESENTS THE PREVAILING VISIBILITY (2-1/2).**

| FOUR SECTORS | |
|---|---|
| **VISIBILITY (MILES)** | **APPROXIMATE DEGREES** |
| **5** | **90** |
| **2 1/2*** | **90** |
| ---------- | **180** |
| **2** | **90** |
| **1 1/2** | **90** |




| TYPE METAR SPECI | DATE & TIME (X) UTC ( ) LST | WIND | | | | VISIBILITY |
|---|---|---|---|---|---|---|
| | | DIRECTION (true) | SPEED (knots) | GUST (knots) | VARIABILITY (true) | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| ME | 1156 | 340 | 12 | G20 | 300V030 | 7 |
| ME | 1258 | 310 | 06 | | | 3 |
| SP | 1327 | 000 | 00 | | | 21/2 |

# VISIBILITY (COL 7 CONT)

**ENTER ONLY THE VISIBILITY VALUES LISTED IN**

**THE TABLE BELOW:**

| REPORTABLE VALUES | | |
|---|---|---|
| MANUAL | | |
| 0 | 2-1/2 | 10 |
| 1/16 | 3 | |
| 1/8 | 4 | |
| 1/4 | 5 | |
| 1/2 | 6 | |
| 1 | 7 | |
| 1-1/2 | 8 | |
| 2 | 9 | |

| TYPE METAR SPECI | DATE & TIME (X) UTC ( ) LST | WIND | | | | VISIBILITY |
|---|---|---|---|---|---|---|
| | | DIRECTION (true) | SPEED (knots) | GUST (knots) | VARIABILITY (true) | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| ME | 1156 | 340 | 12 | G20 | 300V030 | 7 |
| ME | 1258 | 310 | 06 | | | 3 |
| SP | 1327 | 000 | 00 | | | 21/2 |

# REVIEW (COLS 1-7)

- **COLS 1 AND 2:**

***METAR*** IS A STANDARD HOURLY OBSERVATION.

***SPECI*** IS FOR FOR SIGNIFICANT EVENTS.

***TIME:*** ENTER TIMES FROM 55 TO 59 MINUTES PAST THE HOUR
ENTER SPECI TIME WHEN THE EVENT OCCURED.

- **COL 3:**

ENTER WIND DIRECTION IN TENS OF DEGREES (310, 050)
ENTER **"000"** FOR CALM WINDS

**COL 4**:

ENTER WIND SPEED IN WHOLE KNOTS (05, 10, 30).
ENTER **"00"** FOR CALM WINDS

- **COLS 5 AND 6:**

ENTER GUSTS ONLY WHEN OBSERVED WINDS FLUCTUATE
10 KNOTS OR MORE BETWEEN PEAKS AND LULLS.
ENTER WHEN WIND DIRECTION VARIES BY 60 DEGREES OR MORE AND WIND SPEEDS ARE GREATER THAN 6 KNOTS.

- **COL 7:**

PREVAILING VISIBILITY: THE GREATEST DISTANCE THAT OBJECTS CAN BE SEEN THROUGHOUT AT LEAST 1/2 OF THE HORIZON CIRCLE.

| TYPE METAR SPECI | DATE & TIME (X) UTC ( ) LST | WIND | | | | VISIBILITY (nm) |
|---|---|---|---|---|---|---|
| | | DIRECTION (true) | SPEED (knots) | GUST (knots) | VARIABILITY (true) | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| ME | 1156 | 340 | 12 | G20 | 300V030 | 7 |
| ME | 1258 | 310 | 06 | | | 3 |
| SP | 1327 | 000 | 00 | | | 2 1/2 |

# PRESENT WEATHER (COL 9)

| PRESENT WEATHER<br>9 | SKY CONDITION<br>10 | TEMP ($^{O}$C)<br>11 | DEW POINT ($^{O}$C)<br>12 |
|---|---|---|---|
| | | | |
| HZ | | | |
| -SHRAFG | | | |

- THE TABLE BELOW INDICATES THE TYPES OF PRESENT WEATHER IN ORDER OF PRECEDENCE.

- WHEN MORE THAN ONE TYPE OF PRESENT WEATHER IS REPORTED AT THE SAME TIME, REPORT IN THE FOLLOWING ORDER:

**1. TORNADIC ACTIVITY (INCL FUNNEL CLOUDS & WATERSPOUTS).**

**2. THUNDERSTORM**

**3. PRESENT WEATHER IN DECREASING DOMINANCE,**

**(THE MOST DOMINANT IS REPORTED FIRST).**

**4. LEFT TO RIGHT (COLS 1-5) BELOW.**

| QUALIFIER | | WEATHER PHENOMENA | | |
|---|---|---|---|---|
| **INTENSITY OR PROXIMITY**<br>**1** | **DESCRIPTOR**<br>**2** | **PRECIPITATION**<br>**3** | **OBSCURATION**<br>**4** | **OTHER**<br>**5** |
| - Light<br>Moderate<br>+ Heavy<br>**VC** in the vicinity | **MI** Shallow<br>**PR** Partial<br>**BC** Patches<br>**DR** Low Drifting<br>**BL** Blowing<br>**SH** Shower(s)<br>**TS** Thunderstorm | **DZ** Drizzle<br>**RA** Rain<br>**SN** Snow<br>**SG** Snow Grains<br>**IC** Ice Crystals<br>**PE** Ice Pellets<br>**GR** Hail<br>**GS** Small Hail and/or Snow Pellets<br>**UP** Unknown Precipitation | **BR** Mist<br>**FG** Fog<br>**FU** Smoke<br>**VA** Volcanic Ash<br>**DU** Widespread Dust<br>**SA** Sand<br>**HZ** Haze<br>**PY** Spray | **PO** Well Developed Dust/Sand Whirls<br>**SQ** Squalls<br>**FC** Funnel Cloud Tornado Waterspout<br>**SS** Sandstorm<br>**DS** Duststorm |

1. Tornadoes and waterspouts shall be coded as +FC.

# SKY CONDITION (COL 10)

## SKY CONDITION DEFINITIONS:

A . ***SKY COVER:*** THE AMOUNT OF THE CELESTIAL DOME HIDDEN BY CLOUDS OR AN OBSCURATION.

B ***SUMMATION LAYER AMOUNT***: THE AMOUNT OF SKY COVER AT OR ABOVE EACH REPORTED LAYER. ( BEGIN LOW, THEN MID, THEN HIGH).
- NO SINGLE CLOUD LAYER CAN HAVE A SUMMATION AMOUNT **>8/8THS.**

C. ***LAYER HEIGHT***: THE HEIGHT OF THE BASE OF EACH REPORTED LAYER OF CLOUDS.

D. ***CEILING***: THE HEIGHT OF THE LOWEST LAYER OF CLOUDS THAT IS BROKEN OR OVERCAST **(>4/8 OR >1/2 THE SKY).**

| PRESENT WEATHER<br>9 | SKY CONDITION<br>10 | TEMP ($^{O}$C)<br>11 | DEW POINT ($^{O}$C)<br>12 | WET BULB ($^{O}$C)<br>20 | ALTIMETER SETTING (ins)<br>13 |
|---|---|---|---|---|---|
| | FEW010 SCT043 BKN180 | | | | |
| HZ | SCT008 BKN040 | | | | |
| -SHRAFG | BKN008 OVC025 | | | | |

# SKY CONDITION (COL 10 CONT)

## CLOUDS TYPES AND HEIGHTS:

- **LOW CLOUDS** (NR SURFACE TO 6,500 FT)
  ST, NS, SC, CU, TCU, CB
- **MIDDLE CLOUDS** (6,500 TO 16,500 FT)
  AS, AC,
- **HIGH CLOUDS** ( ABOVE 16,500 FT)
  CI, CS, CC

- ENTER CLOUDS HEIGHTS IN COL 10 ACCORDING TO THE FOLLOWING TABLE:

**EX:** 043 IS 4,300 FT (NEAREST 100 FT)
180 IS 18,000 FT (NEAREST 1,000 FT)

| Range of Height Values (feet) | Reportable Increment (feet) |
|---|---|
| ≤5,000 | To nearest 100 |
| >5,000 but <10,000 | To nearest 500 |
| >10,000 | To nearest 1,000 |

| PRESENT WEATHER<br>9 | SKY CONDITION<br>10 | TEMP (°C)<br>11 | DEW POINT (°C)<br>12 | WET BULB (°C)<br>20 |
|---|---|---|---|---|
| | FEW010 SCT043 BKN180 | | | |
| HZ | SCT008 BKN040 | | | |
| SHRAFG | BKN008CB OVC025 | | | |

# SKY CONDITION (CONT)

## STEPS FOR DETERMINING SKY COVER:

1. ESTIMATE THE AMOUNT OF SKY COVERED BY THE LOWEST LAYER.
2. DETERMINE IF ADDITIONAL LAYERS OF CLOUDS ARE PRESENT ABOVE THE LOWEST LAYER USING THE SUMMATION PRINCIPLE.
3. RECORD THE HEIGHT OF EACH CLOUD LAYER IMMEDIATELY FOLLOWING THE SKY COVER AMOUNT.

**USE THE TABLE BELOW TO MATCH THE PROPER CONTRACTION TO THE AMOUNT FOR THE LAYER.**

| REPORTABLE CONTRACTION | MEANING | SUMMATION AMOUNT OF LAYER |
|---|---|---|
| VV | Vertical Visibility | 8/8 |
| SKC | Clear | 0 |
| FEW | Few | 1/8 - 2/8 |
| SCT | Scattered | 3/8 - 4/8 |
| BKN | Broken | 5/8 - 7/8 |
| OVC | Overcast | 8/8 |

| PRESENT WEATHER 9 | SKY CONDITION 10 | TEMP ($^{O}$C) 11 | DEW POINT ($^{O}$C) 12 | WET BULB ($^{O}$C) 20 | ALTIMETER SETTING (ins) 13 |
|---|---|---|---|---|---|
| | FEW010 SCT043 BKN180 | | | | |
| HZ | SCT008 BKN040 | | | | |
| -SHRAFG | BKN008CB OVC025 | | | | |

# OBTAINING ACCURATE TEMPERATURES

– ENSURE PSYCHROMETERS ARE USED IN BOTH SHADY AND **WELL VENTILATED AREAS**.

- ENSURE PSYCHROMETERS ARE CLEAR OF AREAS THAT ARE SUBJECT TO:

1. **EXTERIOR VENTILATION DUCTS**
2. **NO VENTILATION**
3. **EXCESSIVE DECK PLATE HEATING**

– **ENSURE WET BULB WICKS ARE BOTH CLEAN AND WET PRIOR** TO OBTAINING TEMPERATURES.

# TEMPERATURE/DEW POINT & WET BULB TEMPERATURE (COLS 11/12/20)

- **TEMPERATURE COL 11:**
  - RECORD THE DRY BULB TEMP TO THE NEAREST TENTH DEGREE **(CENTIGRADE).**
  - PREFIX SUBZERO TEMPERATUES WITH **“M”.**
  - ADD A LEADING ZERO TO SINGLE DIGIT TEMPERATURES (**02,05).**
- **DEWPOINT TEMP COL 12:**
  - RECORD TO THE NEAREST WHOLE DEGREE.
- **WET BULB TEMP COL 20:**
  - MEASURE THE LOWEST TEMPERATURE OBSERVED.
  - ENTER THE SAME AS COL 11.

| PRESENT WEATHER 9 | SKY CONDITION 10 | TEMP ($^{O}$C) 11 | DEW POINT ($^{O}$C) 12 | WET BULB ($^{O}$C) 20 | ALTIMETER SETTING (ins) 13 |
|---|---|---|---|---|---|
| | FEW010 SCT043 BKN180 | 10.7 | 08 | 08.5 | |
| HZ | SCT008 BKN040 | 10.7 | 08 | 08.4 | |
| -SHRAFG | BKN008CB OVC025 | 10.7 | 09 | 09.8 | |